

CLAIMS

What is claimed is:

1. A downhole telemetry and power system for use with a borehole extending into a formation, the borehole including a casing positioned within the borehole and a piping structure contained within the casing, the system comprising:

a surface data processor operative to provide data and commands in a digital format;

a surface modem having an input coupled to the surface data processor and an output coupled to the casing and piping structure, the surface modem operative to modulate a signal having a first frequency band with data and commands received from the surface data processor in a first modulation scheme to provide a transmitted command and data signal;

a downhole modem coupled to the casing and piping structure and configured and arranged to receive the transmitted command and data signal, the downhole modem operative to demodulate the first modulation scheme and to recover the downhole transmitted data and commands;

a retentive memory operative to store data and commands;

a downhole processor coupled to the retentive memory and to the downhole modem, the downhole processor operative to receive recovered data and commands from the downhole modem and to store the recovered data and commands in the retentive memory;

whereby the downhole processor is reprogrammed from the surface data processor using the transmitted data and commands.

2. The system of claim 1 wherein the retentive memory is a FLASH memory.

3. The system of claim 1 wherein the transmitted data and commands can include new receive and transmit carrier frequency values.

4. The system of claim 1 wherein the transmitted data and commands can include a new modulation structure and the appropriate executable digital signal processing code to process same.

5. The system of claim 1 wherein the transmitted data and commands can include a symbol rate value.

6. The system of claim 1 wherein the transmitted data and commands can include a new address value.

7. The system of claim 1 wherein the transmitted data and commands can include new values of parameters associated with the relaying of messages.

8. The system of claim 1 wherein the transmitted data and commands can include changes to the one or more bit fields contained within the communications packet format.

9. The system of claim 1 wherein the transmitted data and commands can include any internal variables and coefficients which form part of the modem processing..

10. The system of claim 1 further including a surface retentive memory coupled to the surface data processor, the retentive memory configured and arranged to receive data and commands from a data source.

11. The system of claim 10 wherein the data source is data transmitted over the Internet.

12. The system of claim 10 wherein the data source is data transmitted over a company intranet.

13. The system of claim 10 wherein the data and commands can include new receive and transmit carrier frequency values.

14. The system of claim 10 wherein the data and commands can include a new modulation structure and the appropriate executable digital signal processing code to process same.

15. The system of claim 10 wherein the data and commands can include a symbol rate value.

16. The system of claim 10 wherein the data and commands can include a new address value.

17. The system of claim 10 wherein the data and commands can include new values of parameters associated with the relaying of messages.

18. The system of claim 10 wherein the data and commands can include changes to the one or more bit fields contained within the communications packet format.

19. The system of claim 10 wherein the transmitted data and commands can include any internal variables and coefficients which form part of the modem processing..

20. The system of claim 10 wherein the data source is the surface data processor.